

9.2 Multiplying and Factoring

Multiplying a monomial by a polynomial is just using the Distributive Property!

It's important to remember that when adding, you may only add like terms. However, when multiplying, any terms may be multiplied together to make a new product. Multiply the coefficients, add the exponents of the like variables, and list the unlike variables in alphabetical order.

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Multiply:

$$4b(5b^2 + b + 6)$$

Using the distributive property means we will multiply $4b$ by each of the three terms inside the parenthesis:

$$4b \cdot 5b^2 \quad 4b \cdot b \quad \text{and} \quad 4b \cdot 6 \quad \text{to get:}$$
$$20b^3 + 4b^2 + 24b$$

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Now you try some

$$\begin{array}{ll} -7h(3h^2 - 8h - 1) & 2x(x^2 - 6x + 5) \\ -21h^3 + 56h^2 + 7h & 2x^3 - 12x^2 + 10x \end{array}$$

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Finding the GCF (greatest common factor)

Find the GCF of $2x^4 + 10x^2 - 6x$

$$\text{GCF} \rightarrow \frac{2x^4}{2x} + \frac{10x^2}{2x} - \frac{6x}{2x}$$
$$x^3 + 5x - 3$$

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Try these:

$$5v^5 + 10v^3$$

$$\frac{5v^5}{5v^3} + \frac{10v^3}{5v^3}$$

$$v^2 + 2$$

$$\text{GCF} = 5v^3$$

$$\frac{4b^3}{2b} - \frac{2b^2}{2b} - \frac{6b}{2b}$$

$$2b^2 - b - 3$$

$$\text{GCF} = 2b$$

After finding the GCF, you can factor it out.
This will be helpful when we start to graph.
Try these:

$$\frac{8x^2}{4x} - \frac{12x}{4x}$$

$$4x(2x - 3)$$

$$\frac{6m^3}{6m} - \frac{12m^2}{6m} - \frac{24m}{6m}$$

$$6m(m^2 - 2m - 4)$$

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